



General

Guideline Title

A.S.P.E.N. clinical guidelines: hyperglycemia and hypoglycemia in the neonate receiving parenteral nutrition.

Bibliographic Source(s)

Arsenault D, Brenn M, Kim S, Gura K, Compher C, Simpser E, American Society for Parenteral and Enteral Nutrition Board of Directors, Puder M. A.S.P.E.N. clinical guidelines: hyperglycemia and hypoglycemia in the neonate receiving parenteral nutrition. JPEN J Parenter Enteral Nutr. 2012 Jan;36(1):81-95. [54 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Grades of recommendation (Strong, Weak, Further Research) are defined at the end of the "Major Recommendations" field.

How Should Blood Glucose Concentration Be Determined In Neonates?

The authors suggest that blood glucose screening be conducted by laboratory serum glucose or glucose electrode measurements rather than point of care reagent test strips (Weak).

What Blood Glucose Concentration Is Associated With Reduced Clinical Complications In Neonates Receiving Parenteral Nutrition (PN)?

The guideline authors suggest keeping the blood glucose concentration <150 mg/dL (Weak).

The guideline authors cannot make a recommendation to determine whether serum glucose should be maintained >40 mg/dL (Recommend Further Research).

The guideline authors recommend treating symptomatic hypoglycemia (Strong).

What Strategies May Be Used To Maintain Optimal Blood Glucose Concentration In Neonates Receiving PN?

The guideline authors suggest that excess energy and dextrose delivery be avoided (Weak) and fat emulsion be added to PN infusion (Weak).

The guideline authors recommend against the use of early insulin therapy to prevent hyperglycemia (Strong).

The guideline authors cannot make a recommendation to evaluate the impact of treating hyper or hypoglycemia on clinical outcomes (Recommend

Further Research).

Definitions:

Grades of Recommendation

Strong: Based on the available evidence, the authors are very certain that benefits do, or do not, outweigh risks and burdens

Weak: Based on the available evidence, the authors believe that benefits and risks and burdens are finely balanced, or appreciable uncertainty exists about the magnitude of benefits and risks. In addition, clinicians are becoming increasingly aware of the importance of patient values and preferences in clinical decision making. When, across the range of patient values, fully informed patients are liable to make different choices, guideline panels should offer weak recommendations.

Further Research: Based on the available evidence, the authors cannot make a recommendation.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Hyperglycemia
- Hypoglycemia

Guideline Category

Diagnosis

Management

Prevention

Screening

Treatment

Clinical Specialty

Nursing

Nutrition

Pediatrics

Intended Users

Advanced Practice Nurses

Hospitals

Nurses

Physician Assistants

Guideline Objective(s)

- To guide clinical practice based on the authors' assessment of current published evidence on glycemic control in the neonate (within the first month of life) receiving parenteral nutrition (PN)
- To examine the parameters for defining, screening, treating and preventing abnormal serum glucose values in the neonate population receiving parenteral nutrition

Target Population

Neonates (within the first month of life) receiving parenteral nutrition (PN)

Interventions and Practices Considered

1. Blood glucose screening (laboratory serum or glucose electrode)
2. Blood glucose concentration target levels
3. Management of symptomatic hypoglycemia
4. Maintenance of optimal blood glucose levels
 - Avoidance of excess energy and dextrose
 - Addition of fat emulsions to parenteral nutrition infusion

Note: The use of early insulin was considered but not recommended.

Major Outcomes Considered

- Mortality
- Weight gain
- Length of stay
- Incidence of hyperglycemia/hypoglycemia
- Magnetic resonance imaging (MRI) abnormalities
- Neurodevelopmental abnormalities

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The first stage is development of specific clinical questions where nutrition support is a relevant mode of therapy, questions to be answered by a rigorous review of the published literature. The questions developed are specific to a life stage group (neonates, pediatrics, adults, geriatrics, pregnancy), in a defined disease-state or clinical setting, and focused on clinical outcomes associated with nutrition support therapy.

Published literature through 2008 was searched and reviewed.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) system combines all the references obtained for a given question into a table that is organized by clinical outcome. The criteria to be used in evaluating the quality of the evidence are summarized in Table 2 in the original guideline document. Consistency, directness, precision and risk of publication bias are important to include in the assessment of evidence quality.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

These Clinical Guidelines were developed under the guidance of the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Board of Directors.

A.S.P.E.N. Clinical Guidelines has adopted concepts of the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) working group (<http://www.gradeworkinggroup.org>). The GRADE working group combined the efforts of evidence analysis methodologists and clinical guidelines developers from diverse backgrounds and health organizations to develop an evaluation system that would provide a transparent process for evaluating the best available evidence and integration of the evidence with clinical knowledge and even consideration of patient priorities. These procedures provide added transparency by developing separate grades for the body of evidence and for the recommendation. The procedures were adopted from the GRADE process for use with A.S.P.E.N. Clinical Guidelines with consideration of the levels of review (by internal and external content reviewers, by A.S.P.E.N.) and editing expected for approval by the A.S.P.E.N. Board of Directors.

Three primary stages are involved in developing a Clinical Guideline. The first stage is development of specific clinical questions where nutrition support is a relevant mode of therapy, questions to be answered by a rigorous review of the published literature. The questions developed are specific to a life stage group (neonates, pediatrics, adults, geriatrics, pregnancy), in a defined disease-state or clinical setting, and focused on clinical outcomes associated with nutrition support therapy. The second stage is a transparent process that describes how each research report is evaluated. Finally, a Clinical Guideline recommendation incorporates expert clinical judgment about the context of application of this research into a practice setting with consideration of the relative risks and benefits of doing so.

Rating Scheme for the Strength of the Recommendations

Grades of Recommendation

Strong: Based on the available evidence, the authors are very certain that benefits do, or do not, outweigh risks and burdens

Weak: Based on the available evidence, the authors believe that benefits and risks and burdens are finely balanced, or appreciable uncertainty exists about the magnitude of benefits and risks. In addition, clinicians are becoming increasingly aware of the importance of patient values and preferences in clinical decision making. When, across the range of patient values, fully informed patients are liable to make different choices, guideline panels should offer weak recommendations.

Further Research: Based on the available evidence, the authors cannot make a recommendation.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The procedures were adopted from the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) process for use with the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Clinical Guidelines with consideration of the levels of review (by internal and external content reviewers, by A.S.P.E.N.) and editing expected for approval by the A.S.P.E.N. Board of Directors.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence includes randomized controlled trials and observational studies.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Improved screening, diagnosis and treatment of hyper- and hypoglycemia in neonates receiving parenteral nutrition

Potential Harms

In patients receiving cycled parenteral nutrition (PN), intravenous dextrose and PN formulations should be tapered off over 1-2 hours to prevent reactive hypoglycemia.

Qualifying Statements

Qualifying Statements

The American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Clinical Guidelines are based upon general conclusions of health professionals who, in developing such Guidelines, have balanced potential benefits to be derived from a particular mode of medical therapy against certain risks inherent with such therapy. However, the professional judgment of the attending health professional is the primary component of

quality medical care. Because guidelines cannot account for every variation in circumstances, the practitioner must always exercise professional judgment in their application. These Clinical Guidelines are intended to supplement, but not replace, professional training and judgment.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jan

Guideline Developer(s)

American Society for Parenteral and Enteral Nutrition - Professional Association

Source(s) of Funding

American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.)

Guideline Committee

Not stated

Composition of Group That Authored the Guideline

Authors: Danielle Arsenault, RN, MSN; Megan Brenn, RD; Sendia Kim, MD; Kathleen Gura, PharmD; Charlene Compher, PhD, RD, CNSC, LDN, FADA; Edwin Simpser, MD; American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Board of Directors; and Mark Puder, MD, PhD

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [Journal of Parenteral and Enteral Nutrition Web site](#) .

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on January 10, 2013. The information was verified by the guideline developer on February 1, 2013.

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